

CLAIMS

What is Claimed is:

1. A land grid array package, comprising:
 - a substrate having a top surface and a bottom surface;
 - 5 a DC-DC converter provided on said substrate, said DC-DC converter including at least one power silicon die disposed on said top surface of said substrate; and
 - a plurality of electrically and thermally conductive pads provided on said bottom surface of said substrate in electrical communication with said DC-DC converter
 - 10 through respective conductive vias, said plurality of pads including first pads having a first surface area and second pads having a second surface area, said second surface area being substantially larger than said first surface area;
 - wherein, heat generated by said DC-DC converter is conducted out of said land grid array package through said plurality of pads.
- 15 2. The land grid array package of Claim 1, wherein said at least one power silicon die comprises at least one power MOSFET device.
3. The land grid array package of Claim 1, wherein said at least one power silicon die is substantially aligned with at least one of said second pads.
4. The land grid array package of Claim 1, wherein said first pads are
- 20 substantially located in a peripheral region of said bottom surface.
5. The land grid array package of Claim 4, wherein said second pads are substantially located in an interior region of said bottom surface.
6. The land grid array package of Claim 1, wherein said first pads are substantially located at a first side of said bottom surface.

7. The land grid array package of Claim 6, wherein said second pads are substantially located at a second side of said bottom surface.

8. The land grid array package of Claim 1, wherein said at least one power silicon die further comprises a high side MOSFET device and a low side MOSFET device.

9. The land grid array package of Claim 1, wherein said at least one power silicon die further comprises a first pair of MOSFET devices and a second pair of MOSFET devices.

10. The land grid array package of Claim 9, wherein said first pair of MOSFET devices are substantially aligned with a first corresponding pair of second pads disposed adjacent a first side of said bottom surface, and said second pair of MOSFET devices are substantially aligned with a second corresponding pair of second pads disposed adjacent a second side of said bottom surface.

11. The land grid array package of Claim 1, wherein said substrate comprises a plurality of die attach pads provided on said top surface, said at least one power semiconductor die being mounted to a corresponding one of said plurality of die attach pads.

12. The land grid array package of Claim 1, wherein said DC-DC converter further comprises a plurality of discrete passive components electrically coupled to said at least one power semiconductor die.

13. The land grid array package of Claim 1, further comprising a plurality of vias extending through said substrate, each one of said plurality of vias having a first end located proximate to said at least one power semiconductor die and a second end located proximate to one of said second pads.

14. The land grid array package of Claim 13, wherein said plurality of vias are arranged in an array located beneath said at least one power semiconductor die.

15. The land grid array package of Claim 14, wherein said array is electrically and thermally coupled to said at least one power semiconductor die and said one of
5 said second pads.

16. The land grid array package of Claim 1, wherein said DC-DC converter further comprises a buck converter.

17. The land grid array package of Claim 1, wherein said DC-DC converter further comprises a two-phase buck converter.

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